

The present invention is directed to the transfer of a tissue culture onto a wound from a dressing, so that it is incorporated into the adjacent body region. Thus, the dressing of the invention has the following features:

- a) before application to a body region, e.g., a wound, a tissue of cells to be incorporated into the region is securely anchored to a carrier surface, but
- b) after application, the anchored cell tissue is smoothly released from the dressing at a desired rate and to a desired degree as it is incorporated into the adjacent body region.

Specifically, a biodegradable cell anchoring layer, e.g., of heparin, is disposed on a wound dressing carrier surface that is non-cell-adherent. This provides a surface that is cell-adherent and that before application of the dressing to a wound anchors the cells that are to be incorporated into the adjacent body region after application. The layer with the surface that is cell-adherent biodegrades after application to expose the cell tissue to a dressing carrier surface that is non-cell-adherent, which ensures release of anchored cells as these are incorporated into the adjacent body region at a desired rate and to a desired degree.

The present invention also provides a parallel method of treating the mammalian body with a cell tissue dressing of the present invention.

The mode of use of the present cell tissue dressing is entirely different from that of the artificial skin of Cahn and the artificial skin of Yannas disclosed in Cahn (page 1, lines 12-14). The prior art artificial skin may have a layer of biodegradable material, e.g., cross-linked collagen-glycosamine (page 8, lines 28-34 and page 9, lines 25-30), which may be cell-adherent (page 2, lines 19, 20). This biodegradable layer may be

disposed on a carrier surface, although no reference can be found on pages 12, 13 of Cahn to polyurethanes siliconised on a wound-facing surface to make it non-cell-adherent. The main criterion for the material of the carrier is that it bonds strongly to, e.g., cross-linked collagen-glycosamine (page 12, line 28 to page 13, line 17). Cahn neither discloses nor suggests anything about providing a surface that is non-cell-adherent.

It is clear that the artificial skin of Cahn and the artificial skin of Yannas disclosed in Cahn are exactly that: artificial materials which bear no cell tissue to be incorporated into the body region to which the skin is applied. The fibroblasts referred to are those in the wound under the biodegradable layer. Cahn nowhere even contemplates any need for a tissue of cells of any sort to be applied by a dressing to a wound to be incorporated into the adjacent body region, as in the present invention. The biodegradable layer is thus not a cell-anchoring layer (see pages 2 and 9, *passim.*), and there is no need for a carrier surface that is non-cell-adherent, since there are no adherent cells whose release needs to be facilitated to help their incorporation into the adjacent body region.

By this amendment, the claims have been amended to require a dressing in which the biodegradable cell anchoring layer, e.g., of heparin, bears cells. There is no teaching whatsoever in Cahn of a layer of cells of any sort on the biodegradable wound contacting layer. Moreover, Cahn fails to disclose or suggest any need for a tissue of cells of any sort to be applied by a dressing to a wound to be incorporated into the adjacent body region, as in the present invention.

In fact, there is no teaching whatsoever in Cahn of treating the human or animal body with a cell tissue dressing, as in the present invention. Nor is there any teaching

that the surface of the biodegradable wound contacting layer should anchor the cells to be incorporated into the wound before application of the dressing to a wound region, but biodegrades after application to achieve a desired rate and degree of release of adherent cells as these are incorporated into the adjacent body region. There is no teaching in Cahn about providing a carrier surface that is non-cell-adherent to facilitate the release of adherent cells as these are incorporated into the adjacent body region.

Accordingly, this rejection is clearly inappropriate and should be withdrawn.

Claims 1-19 were rejected under 35 USC § 103 as unpatentable over Cahn in view of Richardson et al (WO 97/06835) and Soon-Shiong et al (WO 93/09176). This rejection is respectfully traversed and reconsideration is requested for the reasons that follow.

As discussed above, Cahn fails to disclose or suggest the combination of:

- i) a layer of cell tissue to be transferred onto a wound from a dressing biodegradable cell-anchoring layer, and
- ii) a cell-adherent carrier surface that releases adherent cells as the cell-anchoring layer biodegrades after application to achieve a desired rate and degree of release of adherent cells as these are incorporated into the adjacent body region.

In sharp contrast to the present invention, Richardson is directed solely to providing a layer of cells that is securely anchored to a carrier surface. No reference can be found specifically to a wound dressing carrier surface that is non-cell-adherent bearing a biodegradable cell-anchoring layer with tissue to be incorporated into a wound. Release of anchored cells by a non-cell-adherent surface is not taught. In fact,

Richardson teaches absolutely nothing about the concept of or the need to provide a combination of:

- i) a layer of cell tissue to be transferred onto a wound from a dressing biodegradable cell-anchoring layer, and
- ii) a cell-adherent carrier surface that releases adherent cells as the cell-anchoring layer biodegrades after application to achieve a desired rate and degree of release of the cells.

Indeed, the teaching of Richardson is strikingly and directly away from providing a material such as the cross-linked collagen-glycosamine of Cahn as a cell adherent. Thus, (from, e.g., page 4, last and penultimate paragraphs) Richardson teaches that preferred materials of the carrier on which the cell-anchoring surface exists are synthetic polymers, listed on page 7. On page 5, first and second paragraphs, Richardson teaches treatment of the surface of the carrier to make it a cell-anchoring layer. None of these are taught to be biodegradable.

Similarly, it is clear that Richardson is directed to the hydrophilicity, hydrophobicity and/or water uptake of the carrier layer, and equally clear from the foregoing that these parameters are indicated as being irrelevant to whether any corresponding surface is a non-cell-adherent/cell-adherent carrier surface.

Thus, one of ordinary skill in the art seeking to achieve the present invention would not look to Richardson, and even if he/she were to do so, would not be motivated to combine this teaching with the artificial skin of Cahn. The cell tissue dressing and method of treating the mammalian body with a cell tissue dressing of the present

invention are accordingly clearly inventive over the combination of Cahn and Richardson.

Like Richardson, Soon-Shiong fails to teach a wound dressing carrier surface that is non-cell-adherent bearing a biodegradable cell-anchoring layer with tissue to be incorporated into a wound. Release of anchored cells by a non-cell-adherent surface is not taught. Soon-Shiong fails to disclose or suggest the combination of

- i) a layer of cell tissue to be transferred onto a wound from a dressing biodegradable cell-anchoring layer, and
- ii) a cell-adherent carrier surface that releases adherent cells as the cell-anchoring layer biodegrades after application.

Accordingly, one of ordinary skill in the art would simply not be motivated to combine the teachings of Cahn with Soon-Shiong and, even if these teachings were combined, the present invention would not result.

This rejection should, therefore, be withdrawn.

In view of the foregoing, this application is in condition for immediate allowance.

Favorable consideration is respectfully requested.

Respectfully submitted,



By: Linda R. Poteate
Registration No.: 36,255

Date: August 9, 2001

LARSON & TAYLOR, PLC • 1199 North Fairfax St. • Suite 900 • Alexandria, VA 22314 • (703) 739-4900



ATTACHMENT B

Marked Up Replacement Claims

Following herewith is a marked up copy of each rewritten claim.

1. (Amended) A wound dressing comprising a carrier layer having a wound-facing surface, said surface being non-adherent to anchorage-dependent cells and having disposed thereon a biodegradable cell anchoring layer, said anchoring layer having anchored thereto mammalian cells which form a cell layer.

9. (Twice Amended) The wound dressing of claim 7 wherein the polyanion is a heparin, an inositol phosphate, fucoidin, syndecan, betaglycan, perlecan, dextran sulphate, pentosan, mesoglycan or polyvinyl sulphate, and wherein said cell anchoring layer has anchored thereto mammalian cells which form a cell layer comprising either keratinocytes or fibroblasts.